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Observation of the ground state transition in the beta decay of ^{20}F

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We report the first detection of the second-forbidden, non-unique, $2^+ \rightarrow 0^+$, ground-state transition in the beta decay of ^{20}F. A low-energy, mass-separated ^{20}F beam produced at the IGISOL facility in Jyväskylä, Finland, was implanted in a thin carbon foil and the beta spectrum measured using a magnetic transporter and a plastic-scintillator detector. The log-ft value inferred from the observed beta yield is remarkably large, making this the strongest second-forbidden, non-unique transition ever measured. The result is supported by shell-model calculations and has important implications for the final evolution of Super-AGB stars.

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